BRISTOL COMPRESSORS, INC.

BRISTOL, VIRGINIA 24201

AIR CONDITIONING COMPRESSOR MODELS

"A" SERIES	"B" SERIES	"C" SERIES
H20A323AB	H20B193AB	H21C463AB
H20A403AB	H20B203AB	H21C463DB
H20A403DB	H20B243AB	H21C533AB
	H20B283AB	H21C533DB
		H21C613AB
		H21C613DB
		H21C683AB
		H21C683DB

AIR CONDITIONING COMPRESSORS
INSTALLATION & SERVICE INSTRUCTIONS

COMPRESSORS

> **WARNING:** The air conditioning unit is a pressurized system and hazards exist which could result in personal injury. It is therefore recommended that removal and installation of the hermetic compressor be performed by experienced personnel only.

The following instructions are general but do include major points of consideration that will ensure proper installation and protect you from possible personal injury. Please use this as a checklist, taking each item in its order before proceeding to the next. If more detailed information is required, please refer to the Bristol Compressors Service Manual.

☐ 1. **VERIFY PROPER APPLICATION.** Verify that the compressor being replaced and the Bristol compressor have a like capacity for the refrigerant being used and that the voltage and frequency characteristics are the same. Consult your wholesaler if you have any questions about proper compressor application.

> **WARNING:** To avoid electrical shock, power to the compressor should remain off during performance of Steps 2 thru 9.

☐ 2. **DETERMINE CAUSE OF INITIAL FAILURE.** In accordance with the instructions contained in the system manufacturer's service manual and the Bristol Compressors service manual, determine the cause of the initial compressor failure and make any necessary repairs to the system.

☐ 3. **INSTALL THE NEW COMPRESSOR.** Install the new compressor on its base. Be sure to use the new mounting grommets that were shipped with the compressor. If the mounting sleeves shipped with the compressor are used, the mounting bolts will bottom out when tight. Use care not to over compress the mounting grommets when the mounting sleeves cannot be used.

> **WARNING:** Never use oxygen to pressurize a refrigeration or air conditioning system. Oxygen will explode on contact with oil and could cause personal injury. When using high pressure gas such as nitrogen or CO_2 for this purpose, be sure to use a regulator that can control the pressure down to 1 or 2 psig.

☐ 4. **BRAZE ON SUCTION AND DISCHARGE LINES.** Flow an inert gas, such as nitrogen or CO_2, through the system at approximately 2 psig. This will reduce the possibility of oxidization inside the tubing. Braze on the suction and discharge lines and braze the process tube shut following the recommendations listed below: (If the process tube is to be used to process the system, it should be brazed shut after the system has been charged according to Step 9.)

COPPER TUBING: If additional copper tubing is required, use only clean, dehydrated refrigeration grade tubing with sealed ends.

BRAZING ALLOYS: Use Sil-Fos, Easy Flow, Phos Copper, or similar brazing alloys with high tensile strength. **Do not use 95/5, 50/50, or 40/60 soft solder.**

BRAZING PROCEDURE: To ensure properly brazed joints, Bristol Compressors recommends that the following steps be used:

a. Exercise extreme care when cutting and forming tubes to keep dirt, filings and other contaminants from entering the system.

b. Do not use excessive amounts of brazing alloy as some of the excess may penetrate the joint and enter the system.

c. If flux must be used, take necessary precautions to ensure that the flux does not enter the system.

d. Use damp cloths or other heat absorbent material to ensure that the factory brazed joints on the compressor do not become damaged. If damp cloths are used, take care not to allow moisture to enter the system.

e. Do not overheat brazed joints as excess heat will cause formation of copper oxide on the inside wall of the tubing. Flowing an inert gas through the system, as explained in Step 4, will reduce the possibility of oxidization.

☐ 5. **INSTALL FILTER DRIERS. Bristol Compressors recommends the use of adequate sized liquid and suction line filter driers anytime a compressor is replaced. If the new compressor is used as a replacement because of a burned compressor, the use of high acid neutralizing filter driers is recommended. For heat pumps, follow the system manufacturer's recommendations for location of the filter driers.**

☐ 6. **CHECK FILTER DRIER FOR CONTAMINATION.** If internal contamination is heavy, the suction line filter drier may become clogged and ineffective. Check the pressure drop across the the filter drier after approximately 8 hours running time and, if it exceeds 2 psig, replace it.

WARNING: Voltage should not be applied to the compressor with the terminal cover and retainer removed as personal injury could result.

CAUTION: The replacement compressor may become damaged if you fail to check the electrical system against the system manufacturer's service manual and the Bristol Compressors wiring diagrams on Pages 3 and 4 before startup.

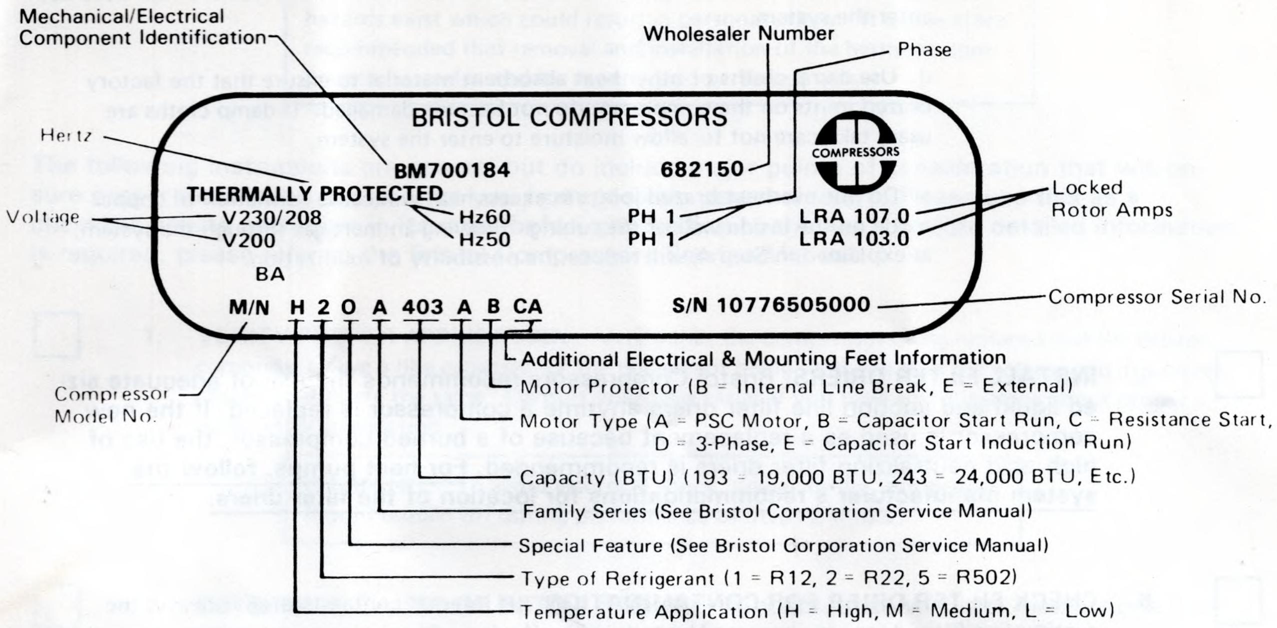
☐ 7. **CHECK THE ELECTRICAL SYSTEM.** Before starting the compressor, verify that the electrical system is wired according to the Compressor Wiring diagrams on Pages 3 and 4. Verify that the components used in the system match those specified in the Compressor Electrical Component Data on Page 4. Check all connections and terminals to be sure that they are tight.

☐ 8. **CHECK SYSTEM FOR LEAKS.** After installation is complete and all electrical checks have been made, pressurize the system to 75 psig using R-22 and check for leaks using a halide torch or an electronic halogen leak detector. When all connections test satisfactorily, release the pressure. When the sound of escaping gas diminishes, proceed with Step 9.

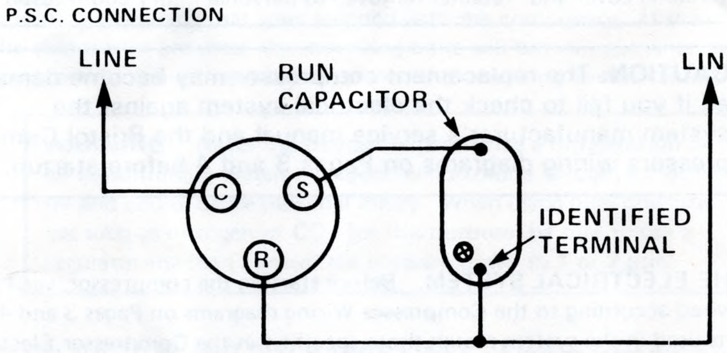
CAUTION: Do not use the Bristol replacement compressor as an evacuation assist and never apply voltage to a compressor while it is in a vacuum as damage could result to the compressor.

☐ 9. **EVACUATE AND CHARGE THE SYSTEM.** Begin evacuation using a vacuum pump designed for this purpose. When a vacuum of 1500 microns is reached, remove the pump and pressurize the system to 25 psig using R-22. Repeat this process two more times but evacuate to 500 microns the last time. Close the valve, remove the pump and charge the system according to the system manufacturer's specifications and recommended procedures.

CODE PLATE:

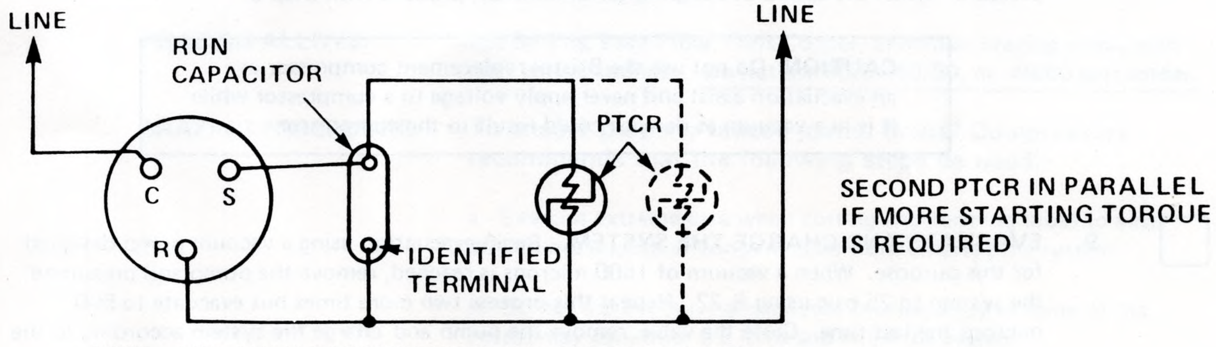

Mechanical/Electrical Component Identification
Wholesaler Number
Phase
BRISTOL COMPRESSORS
COMPRESSORS
Hertz
BM700184
682150
THERMALLY PROTECTED
Voltage
V230/208
V200
Hz60
Hz50
PH 1
PH 1
LRA 107.0
LRA 103.0
Locked Rotor Amps
BA
M/N H 2 0 A 403 A B CA
S/N 10776505000
Compressor Serial No.
Compressor Model No.
Additional Electrical & Mounting Feet Information
Motor Protector (B = Internal Line Break, E = External)
Motor Type (A = PSC Motor, B = Capacitor Start Run, C = Resistance Start, D = 3-Phase, E = Capacitor Start Induction Run)
Capacity (BTU) (193 = 19,000 BTU, 243 = 24,000 BTU, Etc.)
Family Series (See Bristol Corporation Service Manual)
Special Feature (See Bristol Corporation Service Manual)
Type of Refrigerant (1 = R12, 2 = R22, 5 = R502)
Temperature Application (H = High, M = Medium, L = Low)

COMPRESSOR WIRING DIAGRAM:



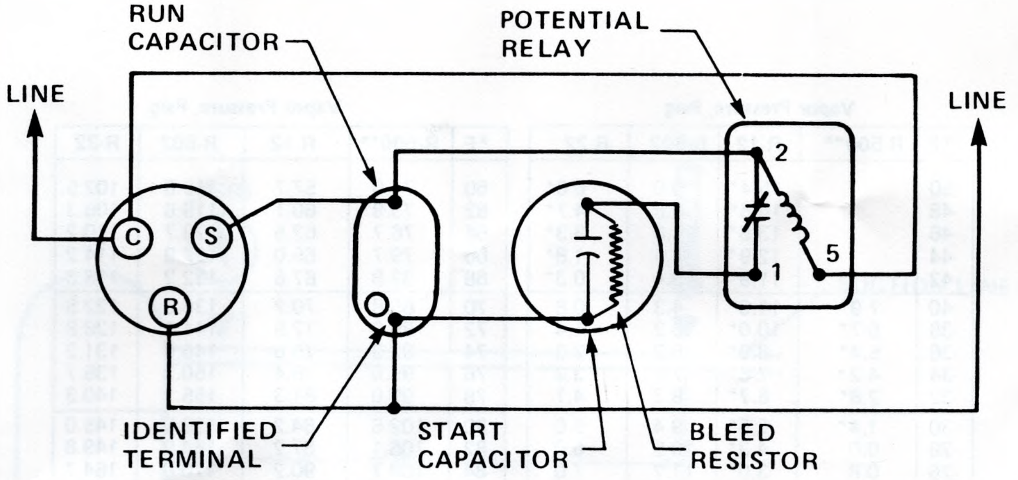
NOTE: USE ONLY RECOMMENDED CAPACITORS

START ASSIST WIRING DIAGRAM (PTCR AND RUN CAPACITOR):



NOTE: USE ONLY RECOMMENDED CAPACITORS AND PTCR

START ASSIST WIRING DIAGRAM (START AND RUN CAPACITORS):



NOTE: USE ONLY RECOMMENDED CAPACITORS AND POTENTIAL RELAY.

CRANKCASE HEATER: "C" Compressors have a PTC type crankcase heater located just under the terminal enclosure. The two wires from this heater should be connected to the incoming line power so that the heater is energized continuously.

COMPRESSOR ELECTRICAL COMPONENT DATA:

Compressor Model Number	Potential Relay Part Number			Start Capacitor (Mfd/Volts)	Run Capacitor (Mfd/Volts)	PTCR PART NUMBER	
	Bristol	General Electric	R.B.M.			Bristol	Sprague
H20A323AB	241039	3ARR3*24P*	128**6-234*P*	88-108/250	35/370	241085	305C2
H20A403AB	241040	3ARR3*25S*	128**6-235*S*	72-88/330	35/440	241085	305C2
H20A403DB†	—	—	—	—	—	—	—
H20B193AB	241039	3ARR3*24P*	128**6-234*P*	88-108/250	25/350	241085	305C2
H20B203AB	241039	3ARR3*24P*	128**6-234*P*	88-108/250	25/350	241085	305C2
H20B243AB	241039	3ARR3*24P*	128**6-234*P*	88-108/250	35/370	241085	305C2
H20B283AB	241039	3ARR3*24P*	128**6-234*P*	88-108/250	35/370	241085	305C2
H21C863AB	241164	3ARR3*4A*	—	135-155/330	40/440	241085	305C2
H21C463DB†	—	—	—	—	—	—	—
H21C533AB	241164	3ARR3*4A*	—	135-155/330	45/440	241085	305C2
H21C533DB†	—	—	—	—	—	—	—
H21C613AB	241164	3ARR3*4A*	—	135-155/330	55/440	241085	305C2
H21C613DB†	—	—	—	—	—	—	—
H21C683AB	241165	3ARR3*6U*	—	135-155/330	55/440	241085	305C2
H21C683DB†	—	—	—	—	—	—	—

† 3-PHASE: NO POTENTIAL RELAY, START RUN CAPACITOR OR PTCR REQUIRED.
* ASTERICK DESIGNATES LETTERS OR NUMBERS WHICH DESCRIBE TERMINAL OR MOUNTING VARIATIONS.

ADDITIONAL

TEMPERATURE-PRESSURE RELATION CHART:

	Vapor Pressure, Psig			
°F	R-500**	R-12	R-502	R-22
-50		15.4*	0.0	6.0*
-48		14.6*	0.8	4.7*
-46		13.8*	1.6	3.3*
-44		12.9*	2.5	1.8*
-42		11.9*	3.4	0.3*
-40	7.9*	11.0*	4.3	0.6
-38	6.7*	10.0*	5.2	1.4
-36	5.4*	8.9*	6.2	2.3
-34	4.2*	7.8*	7.2	3.2
-32	2.8*	6.7*	8.3	4.1
-30	1.4*	5.5*	9.4	5.0
-28	0.0	4.3*	10.5	6.0
-26	0.8	3.0*	11.7	7.0
-24	1.5	1.6*	12.9	8.1
-22	2.3	0.3*	14.2	9.2
-20	3.1	0.6	15.5	10.3
-18	4.0	1.3	16.9	11.5
-16	4.9	2.1	18.3	12.7
-14	5.8	2.8	19.7	13.9
-12	6.8	3.7	20.2	15.2
-10	7.8	4.5	22.8	16.6
-8	8.8	5.4	24.4	18.0
-6	9.9	6.3	26.0	19.4
-4	11.0	7.2	27.7	20.9
-2	12.1	8.2	29.4	22.5
0	13.3	9.2	31.2	24.1
2	14.5	10.2	33.1	25.7
4	15.7	11.2	35.0	27.4
6	17.0	12.3	37.0	29.2
8	18.4	13.5	39.0	31.0
10	19.8	14.6	41.1	32.9
12	21.2	15.8	43.2	34.9
14	22.7	17.1	45.4	36.9
16	24.2	18.4	47.7	39.0
18	25.7	19.7	50.1	41.1
20	27.3	21.0	52.4	43.3
22	29.0	22.4	54.9	45.5
24	30.7	23.9	57.4	47.9
26	32.5	25.4	60.0	50.2
28	34.3	26.9	62.7	52.7
30	36.1	28.5	65.4	55.2
32	38.0	30.1	68.2	57.8
34	40.0	31.7	71.1	60.5
36	42.0	33.4	74.1	63.3
38	44.1	35.2	77.1	66.1
40	46.2	37.0	80.2	69.0
42	48.4	38.8	83.4	72.0
44	50.7	40.7	86.6	75.0
46	53.0	42.7	90.0	78.2
48	55.4	44.7	93.4	81.4
50	57.8	46.7	96.9	84.7
52	60.3	48.8	100.5	88.1
54	62.9	51.0	104.1	91.5
56	65.5	53.2	107.9	95.1
58	68.2	55.4	111.7	98.8
60	71.0	57.7	115.6	102.5
62	73.8	60.1	119.6	106.3
64	76.7	62.5	123.7	110.2
66	79.7	65.0	127.9	114.2
68	82.8	67.6	132.2	118.3
70	85.8	70.2	136.6	122.5
72	89.0	72.9	141.1	126.8
74	92.3	75.6	145.6	131.2
76	95.6	78.4	150.3	135.7
78	99.0	81.3	155.1	140.3
80	102.5	84.2	159.9	145.0
82	106.1	87.2	164.9	149.8
84	109.7	90.2	170.0	154.7
86	113.4	93.3	175.1	159.8
88	117.3	96.5	180.4	164.9
90	121.2	99.8	185.8	170.1
92	125.1	103.1	191.3	175.4
94	129.2	106.5	196.9	180.9
96	133.3	110.0	202.6	186.5
98	137.6	113.5	208.4	192.1
100	141.9	117.2	214.4	197.9
102	146.3	120.9	220.4	203.8
104	150.9	124.6	226.6	209.9
106	155.4	128.5	232.9	216.0
108	160.1	132.4	239.3	222.3
110	164.9	136.4	245.8	228.7
112	169.8	140.5	252.5	235.2
114	174.8	144.7	259.2	241.9
116	179.9	148.9	266.1	248.7
118	185.0	153.2	273.1	255.6
120	190.3	157.7	280.3	262.6
122	195.7	162.2	287.6	269.7
124	201.2	166.7	295.0	277.0
126	206.7	171.4	302.5	284.4
128	212.4	176.2	310.2	291.8
130	218.2	181.0	318.0	299.3
132	224.1	185.9	326.0	307.1
134	230.1	191.0	334.1	315.2
136	236.3	196.1	342.3	323.6
138	242.5	201.3	350.7	332.3
140	248.8	206.6	359.2	341.3
142		212.0	367.8	350.3
144		217.5	376.7	359.4
146		223.1	385.6	368.6
148		228.8	394.7	377.9
150		234.6	404.0	387.2
152		240.5	413.4	396.6
154		246.5	423.0	406.1
156		252.6	432.7	415.6
158		258.8	442.6	425.1
160		265.1	452.6	434.6

* Inches mercury below one atmosphere
**Patented by Carrier Corporation

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